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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/719,422	12/12/2000	Yoshihisa Furuta	Q 62228	7788

7590 05/25/2005

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EXAMINER	
MUSSER, BARBARA J	

ART UNIT	PAPER NUMBER
1733	

DATE MAILED: 05/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/719,422	FURUTA ET AL.	
	Examiner	Art Unit	
	Barbara J. Musser	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 6-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 6-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

5-0-0

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 6(1)-8(1), 10(1)-14(1), 18(1), and 19(1) are rejected under 35 U.S.C. 103(a) as being unpatentable over Mostafazadeh et al. in view of Lin et al. and Senoo et al.(U.S. Patent 5,705,016) and as evidenced by High Performance Films.

Mostafazadeh et al. discloses adhering an adhesive tape to a lead frame having a chip mounted therein, encapsulating the chip and connectors with molding resin, and stripping the tape away.(Figures 5-7; Col. 1, ll. 63- Col. 2, ll. 19) The reference does not disclose the specifics of the adhesive tape but does disclose the tape can be polyimide.(Col. 3, ll. 46). Lin et al. discloses a method of forming chips which are attached to traces and encapsulated wherein the chips and traces are applied to a Kapton film.(Col. 2, ll. 64- Col. 3, ll. 2) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a Kapton film as the basis for the adhesive tape in Mostafazadeh et al. since Lin et al. discloses Kapton film is a well-known film in this art and since Mostafazadeh et al. discloses that any polyimide film can be used.(Col. 3, ll. 46) Neither reference discloses the thermal shrinkage of the tape. High Performance Films discloses that Kapton has thermal shrinkage of 0.10% at

200C. Thus one in the art would understand the film of Lin et al. in the process of Mostafazadeh et al. would have a shrinkage of less than 3%.

While Mostafazadeh et al. does not specifically disclose using a mold to form the resin encapsulated chips, the reference does disclose that a molded plastic casing is formed over the chip.(Col. 2, ll. 13-14) One in the art would understand that a molded casing was made using a mold.

Neither reference discloses the type of adhesive used. Senoo et al. discloses a pressure sensitive adhesive used to hold wafers in place for dicing which has a low adhesive strength(less than 300 gf/25cm) to prevent the adhesive from sticking the frame around the wafer.(Col. 1, ll. 11-16; Col. 4, ll. 63-65) The adhesive can be silicone based.(Col. 4, ll. 52-54) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any of the adhesives of Senoo et al. such as one based on silicone on the film of Lin et al. in the process of Mostafazadeh et al. since the adhesive can hold electronic parts securely and prevents the transfer of adhesive to the material it is attached to(Col. 1, ll. 11-16) which is important since the chip bottoms of Mostafazadeh et al. can be bonded to other materials as is known in the electronics arts and particularly since the adhesive is known in the electronic arts.

Regarding claims 6(1) and 7(1), High Performance Films discloses Kapton has a thermal shrinkage of 0.1% at 200C.

Regarding claims 8(1) and 19(1), Senoo et al. discloses the adhesive strength is 10-300 gf/25mm.(Col. 4, ll. 65)

Regarding claims 10(1) and 11(1), Senoo et al. discloses the tape substrate can be 15-100 microns thick.(Col. 4, ll. 43)

Regarding claims 12(1) and 13(1), Senoo et al. discloses the adhesive can be 5-50 microns thick.(Col. 4, ll. 54)

Regarding claim 14(1), Senoo et al. discloses it is known to use adhesives that cross-link under ultraviolet radiation reducing the adhesive strength.(Col. 6, ll. 66- Col. 7, ll. 2) It would have been obvious to one of ordinary skill in the art at the time the invention was made to include cross-linking materials in the adhesive layer of Mostafazadeh et al., Lin et al., and Senoo et al. since cross-linking the adhesive reduces its adhesive strength as shown by Senoo et al.(Col. 6, ll. 65- Col. 7, ll. 2) and a low adhesive strength material separates cleanly from the surface to which it is adhered(Col. 1, ll. 11-16) which is important since the chip bottoms of Mostafazadeh et al. can be bonded to other materials as is known in the electronics arts and clean surfaces are easier to bond.

3. Claim 9(1) is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above, and further in view of Wang(U.S. Patent 6,306,497).

The references cited above do not disclose the adhesive containing a heat-resistant filler. Wang discloses a method of controlling the peel strength of an adhesive by controlling the number of glass microspheres in the adhesive.(Abstract) It would have been obvious to one of ordinary skill in the art at the time the invention was made to include glass microspheres in the adhesive of Mostafazadeh et al., Lin et al. and

Senoo et al. since this would allow control of the peel strength of the adhesive since a low adhesive strength is desired as shown by Senoo et al. and since Wang shows glass microspheres can modify the adhesive strength.(Abstract)

4. Claim 15(1) is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above, and further in view of Kraft et al.(U.S. Patent 4,240,938).

The references cited above do not disclose surface roughening the substrate before applying the adhesive to it. It is well-known and conventional in the adhesive arts in general to roughen a surface prior to applying adhesive to provide a better surface of the adhesive to bond to, as shown for example by Kraft which discloses roughening the surface of a substrate before applying the adhesive.(Col. 17, ll. 13-19) It would have been obvious to one of ordinary skill in the art at the time the invention was made to roughen the surface of the substrate before applying the adhesive since such is well-known and conventional in the art as shown for example by Kraft which discloses roughening the surface of a substrate before applying the adhesive.(Col. 17, ll. 13-19)

5. Claims 16(1) and 17(1) are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above, and further in view of Fjelstad(U.S. Patent 6,001,671).

The references cited above do not disclose the adhesive containing heat-conductive particles. Fjelstad discloses an adhesive adjacent a chip which contains heat-conductive particles so there is a path to draw heat away from the chip during thermal processing.(Col. 4, ll. 38-45) It would have been obvious to one of ordinary skill

in the art at the time the invention was made to include heat conductive particles in the adhesive so there is a path to draw heat away from the chip.(Col. 4, ll. 38-45)

6. Claims 2, 6(2)-8(2), 10(2)-14(2), 18(2), and 19(2) are rejected under 35 U.S.C. 103(a) as being unpatentable over Mostafazadeh et al. in view of Lin et al., Senoo et al., and High Performance Films as applied to claim 1 above, and further in view of Oida et al.(WO 98/35382) U.S. Patent 6,291,274 is considered an English language translation and all column and line numbers refer to it.

The references cited above do not disclose replacing the lead frame of Mostafazadeh et al. with a tape carrier. Oida et al. discloses tape carriers can be used in place of lead frames when encapsulating chips in resin.(Col. 10, ll. 39-45) It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the lead frame of Mostafazadeh et al. with a tape carrier since such is well-known and conventional in the art as shown for example by Oida et al.(Col. 10, ll. 39-45)

Regarding claims 6(2) and 7(2), High Performance Films discloses Kapton has a thermal shrinkage of 0.1% at 200C.

Regarding claims 8(2) and 19(2), Senoo et al. discloses the adhesive strength is 10-300 gf/25mm.(Col. 4, ll. 65)

Regarding claims 10(2) and 11(2), Senoo et al. discloses the tape substrate can be 15-100 microns thick.(Col. 4, ll. 43)

Regarding claims 12(2) and 13(2), Senoo et al. discloses the adhesive can be 5-50 microns thick.(Col. 4, ll. 54)

Regarding claim 14(2), Senoo et al. discloses it is known to use adhesives that cross-link with ultraviolet reducing the adhesive strength.(Col. 6, ll. 66- Col. 7, ll. 2) It would have been obvious to one of ordinary skill in the art at the time the invention was made to include cross-linking materials in the adhesive layer of Mostafazadeh et al., Lin et al., Senoo et al., and Oida et al. since cross-linking the adhesive reduces its adhesive strength as shown by Senoo et al.(Col. 6, ll. 65- Col. 7, ll. 2) and a low adhesive strength material separates cleanly from the surface to which it is adhered(Col. 1, ll. 11-16) which is important since the chip bottoms of Mostafazadeh et al. can be bonded to other materials as is known in the electronics arts and clean surfaces are easier to bond.

7. Claim 9(2) is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 2 above, and further in view of Wang(U.S. Patent 6,306,497).

The references cited above do not disclose the adhesive containing a heat-resistant filler. Wang discloses a method of controlling the peel strength of an adhesive by controlling the number of glass microspheres in the adhesive.(Abstract) It would have been obvious to one of ordinary skill in the art at the time the invention was made to include glass microspheres in the adhesive of Mostafazadeh et al., Lin et al., Senoo et al., and Oida et al. since this would allow control of the peel strength of the adhesive since a low adhesive strength is desired as shown by Senoo et al. and since Wang shows glass microspheres can modify the adhesive strength.(Abstract)

8. Claim 15(2) is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 2 above, and further in view of Kraft et al.(U.S. Patent 4,240,938).

The references cited above do not disclose surface roughening the substrate before applying the adhesive to it. It is well-known and conventional in the adhesive arts in general to roughen a surface prior to applying adhesive to provide a better surface of the adhesive to bond to, as shown for example by Kraft which discloses roughening the surface of a substrate before applying the adhesive.(Col. 17, ll. 13-19) It would have been obvious to one of ordinary skill in the art at the time the invention was made to roughen the surface of the substrate before applying the adhesive since such is well-known and conventional in the art as shown for example by Kraft which discloses roughening the surface of a substrate before applying the adhesive.(Col. 17, ll. 13-19)

9. Claims 16(2) and 17(2) are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 2 above, and further in view of Fjelstad(U.S. Patent 6,001,671).

The references cited above do not disclose the adhesive containing heat-conductive particles. Fjelstad discloses an adhesive adjacent a chip which contains heat-conductive particles so there is a path to draw heat away from the chip during thermal processing.(Col. 4, ll. 38-45) It would have been obvious to one of ordinary skill in the art at the time the invention was made to include heat conductive particles in the adhesive so there is a path to draw heat away from the chip.(Col. 4, ll. 38-45)

Response to Arguments

10. Applicant's arguments filed 3/16/05 have been fully considered but they are not persuasive.

Regarding applicant's arguments that the adhesive of Senoo is not heated to 180C and therefore its adhesive strength is not comparable to applicant's adhesive strength, both strengths are described at room temperature. There is no indication that increasing the temperature of the adhesive and then decreasing it would change the adhesive strength. The reference indicates that the adhesive should constantly exhibit low adhesive strength or be the type of adhesive that can have its adhesive strength reduced by curing.(Col. 6, ll. 65-Col. 7, ll. 2) This indicates the adhesive strength, even if it increased at a high temperature, could be easily decreased by the application of ultraviolet radiation. Both the reference and applicant have the similar adhesives for similar types of problems and one in the art would expect they would have similar characteristics, namely low adhesive strength after heating. Applicant is advised that the office is not equipped to obtain prior art adhesives and make a physical comparison of the same to applicant's adhesive. Where the prior art appears to show the same adhesive with the same characteristics as applicant's, it is appropriate for applicant to provide evidence that in fact the prior art adhesive and the adhesive of the claim are different products with different characteristics. Applicant is advised that under such circumstances a rejection under 102/103 has been deemed appropriate, see In re Thorpe, 277 USPQ 964, MPEP 2113, In re Brown, 173 USPQ 685.

It is noted that the claim does not actually require heating the adhesive to 180C.

Regarding applicant's argument that ordinary adhesives decompose at 180C, this would indicate the adhesive of Senoo et al. therefore would have less adhesive strength after heating as it seems to be the same type of adhesive as used by applicant. Applicant's claims do not require the adhesive to be usable as an adhesive tape after heating, and applicant's specification actually suggests the adhesive strength has decreased after heating, indicating the decomposition of the adhesive. Therefore, the fact that after heating, the tape of Senoo et al. might not be usable as an adhesive does not negate its use as a reference, as it is then doing exactly what applicant's adhesive is doing.

Regarding applicant's argument that adhesive strength increases with temperature, this appears to contradict the argument immediately preceding it, which indicated that adhesive strength decreased as a result of decomposition at high temperatures. It applicant is arguing that the adhesive strength of Senoo et al. is higher at 180C than required by the claims, the claims measure the adhesive strength at room temperature. If applicant is arguing that after heating, the adhesive strength at room temperature has increased, applicant has provided no evidence to indicate that heating and then cooling the adhesive of Senoo would result in a different adhesive strength before and after heating and cooling. While adhesive strength may increase with temperature, there is no indication in the art that the history of heating and cooling of the adhesive affects the adhesive strength. Absent some showing to this effect, the adhesive strength of Senoo et al. is considered to be the same or less(due to decomposition) after heating as before heating.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara J. Musser whose telephone number is (571) 272-1222. The examiner can normally be reached on Monday-Thursday; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571)-272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BJM

SAM CHUAN YAO
PRIMARY EXAMINER